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# China Report

AGRICULTURE

No. 112

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28 November 1980

## CHINA REPORT

## AGRICULTURE

No. 112

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# 1. GENERAL INFORMATION

## INCREASING OUTPUT OF AUTUMN GRAIN URGED

Beijing NONGCUN GONGZU TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 5, 5 May 80  
p 2

[Article: "Use Every Manner of Means To Increase Autumn Grain Output"]

[Text] The crops to be harvested in the summer are not growing as well this year as they did last because of the protracted onslaught ever since last fall of drought, waterlogging, and freezing. In view of this state of affairs, in addition to efforts to give good care to the summer grain during its later stages of growth as well as to careful reaping and threshing to obtain increased summer grain output, vigorous efforts should be made with the autumn grain output employing every manner of means to increase the autumn grain output so that a bumper harvest in grain output for the year as a whole will be realized.

It must be realized, however, that a constant rise has occurred in the summer grain output during the past several years, and that development has been rapid, while growth of autumn grain output has been sluggish or hesitant in its forward advance. The proportion of grain derived from the summer harvest has risen from 14 percent during the period right after Liberation to 21 percent, while the proportion from the autumn harvest has declined from 77 percent to 62 percent.

Many reasons account for the slowness in the growth of autumn grain production, including both disastrous weather factors and problems of a work related nature. One major reason is that quite a few places have not given sufficient attention to autumn grain output; they reduced the area planted to autumn grain year after year, and some continually diminished the planting of intermediate rice and autumn-harvested crops that have always produced consistent and high output. In the use of fertilizer, they emphasized summer applications only to skimp in autumn so that the amount of fertilizer for growth of autumn grain was seriously inadequate. Some relaxed care, planted late, had plants that were not sturdy, and allowed serious weed problems.

Leadership at every echelon has to increase its perception and give serious attention to autumn grain output. Autumn grain is the most important part of China's grain output. The area sown and the output amounts to about two-thirds that of the entire country's grain output. Whether the autumn grain output is bumper or slim determines the overall situation in grain output for the entire year. It is not a matter of little importance, but a matter of decisive importance. Without a rise in autumn grain output, there can be no rapid increase in the growth of

overall grain output. The national economy and the people's livelihood must consequently be inevitably impaired, the speed of the development of all of agriculture affected, and four modernization construction impaired, which are matters not to be treated lightly. A look at the situation over the last several years shows that it has been because of year after year increases in grain output that popular sentiment has been tranquil, every industry has flourished, and market conditions have become increasingly better, and the development of all agriculture has been promoted.

In order to increase autumn grain output, there has to be diligent implementation of the party's policies. The bumper harvests in agriculture of the past two years are attributable to implementation of the two Central Committee documents on agriculture, and implementation of the principle of to each according to his work, which have aroused the enthusiasm of cadres and the masses. In management, continued stress must continue to be laid on all forms of production responsibility systems. Cadres should penetrate into the grassroots levels, propagandize government policies, educate the masses, change backward production outlook, and effectively solve problems existing in autumn harvest output.

Cadres and the masses alike must be taught to firmly implant a mentality of year round combat against calamities to gain bumper harvests. The early season of autumn grain growth is one of high temperatures, while early frost may occur during the late season. Calamities happen often, and droughts, waterlogging and early frost, in particular, may take place every year. Disasters resulting from wind, hailstones, insects and disease also continually happen. The slightest bit of inattention to such calamities can impair high and consistent output of autumn grain, so one can never lower his guard. Harvesting of a bumper crop of autumn grain must be rooted in combat against calamities and based upon combat against great calamities, combat against numerous calamities, combat against calamities when they occur, and guarding against calamities when they do not occur to achieve preparedness that averts peril. Reliance must be placed on the masses for combat against calamity and the reaping of bumper harvests, and there must be understanding and mastery of natural laws, with unceasing summary of experiences in combating calamities, the adoption of measures adapted to local conditions, and efforts to make the most of advantages while avoiding disadvantages. In this way losses from calamities can be reduced to the minimum so that either no reduction in output occurs, or bumper harvests are reaped in years of calamity.

Agriculture is an integrated whole and so we must deal with the total situation to set up year round preparations, plan as a whole, properly handle the early part of the season and the late part of the season, and understand the relationship between coarse food grains [e.g. corn, sorghum, and millet] and fine food grains [e.g. wheat and rice], and between staple food grains and other food grains. In providing the means of production needed in agriculture, we should look both ahead and behind, make rational distribution, and think about the autumn season even while giving attention to the summer season. Such overall consideration and mutual promotion will accelerate the development of agriculture.

We are determined to diligently adhere to the spirit of the Third Plenary Session of the 11th Party Central Committee and the Fifth National People's Congress to do a good job in all aspects, to master every production link without missing any opportunities and to strive for a greatly increased output of autumn grain in order to promote the faster development of all agriculture, and to make a new contribution to four modernization construction!



## DIFFICULTY IN SELLING HOGS PROTESTED

Beijing NONGCUN GONGZUO TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 4, 5 Apr 80  
p 33

[Article by Correspondent Jiang Shulian [3068 2885 1670]: "A Problem Urgently in Need of Solution"]

[Text] In 1979, Jiangsu Province's production, sales to the state, marketing, shipments to other provinces, and exports of live pigs were the highest in history. An estimated 16.6 million fattened hogs were shipped to market for a 5.9 million increase over the previous year. With the growth in production of live pigs came a great increase in organic pig fertilizer for agriculture. If the manure from a single head amounts to 50 dan, then the amount collected for a year from the feeding of 40 million head is sufficient to provide 30 dan of fine quality fertilizer to every mu of collectively farmed land. Jiangsu Province's year after year bumper harvests are closely related to its production of live pigs. In addition, peasant income has increased. During 1979, each household in the entire province sent an average of 1.4 hogs to market for an average net profit per household of about 100 yuan. Nevertheless, as a result of the greatly increased output of hogs, once prices rose, the masses' purchasing power was definitely limited, with the result that the amount of pork put into storage increased greatly over previous years. As of the end of last year, storage throughout the province increased 91 percent over the previous year, and everywhere a situation developed in which production was greater than state procurement, and state procurement was greater than sales. Beginning in November and December last year, the procurement departments in many places instituted a system of hog sales only by coupon to control matters through limited procurement. If Nie County had 210,000 fat hogs for sale before the lunar new year and the procurement departments ruled each production brigade could sell only two or three head by coupon daily, more than 4 months would be required to sell all the pigs, the pigs continuing to be fattened during this period not being included. The 14 production brigades in the Jianshe Commune in that county currently have 298 fat hogs weighing more than 180 jin each in pens, but the procurement departments will accept only two head each day. At this rate, it will take 5 months before the procurement department accepts all of them. Wujin County's fat hogs cannot be accepted for procurement within the county, so they are shipped to market in Changzhou, but procurement by the state is not possible in Changzhou either. Every day from 40 to 50 farm boats loaded with fat hogs are lined up waiting along the riverbanks, and after a wait of several days, some pigs sicken or die. The masses say, "To raise pigs is difficult but to sell them is sad." In Taixing County the line of people trying to sell pigs stretches



3 li, and in order to sell a pig, one has to find an acquaintance, use contacts, resort to backdoor deals, and invite people to dine or give them gifts. The masses say, "When pigs are short, the food departments come wheedling at your door, but when pigs are numerous, the food departments push you away. With the wheedling then and the pushing away now, pig farmers just can't win nohow."

When grown hogs cannot be sold and there is no room for young hogs, the price for shoats plunges from 1 yuan per jin to .60 or .70 yuan, and slaughtering of sows has begun in some places. Between 1 and 4 January this year, 49 sow skins were procured by the state at the Xiahqiqiao Commune in Jiangyin County. As of now, a considerable number of communes and production brigades have begun to restrict the raising of hogs. In addition, instances in which the state has refused to buy vegetables and sheep have occurred in Nantong, Huaiyin, and Yancheng prefectures.

The above state of affairs exists in Zhejiang Province and in Shanghai as well. Unless urgent measures are taken, a great decline will take place in this year's output of hogs and sheep.

Postscript. The situation reflected in Comrade Jiang Shulian's letter exists in varying degrees in other areas as well, where there has been a great deal of development in hog production. This is a weighty problem, which should arouse the serious attention of party and government leadership organizations and departments concerned everywhere.

Great growth occurred in hog output in China last year, and it is extremely heartening that the peasants increased their incomes and the people in cities and villages had an increased supply of pork. Still, one positively cannot suppose that leadership can be relaxed when a lot of pigs have been raised. Last year's supply of pork nationwide averaged increases of no more than 3 jin or so, so the level of pork consumption remained very low. At the same time, the large amount of pigs, fertilizer, and grain available played a major role in promoting the development of agricultural production and in increasing the peasants' income. Therefore, strengthening of leadership is still required together with a deep understanding of the situation in order to solve new problems. But communes and brigades and procurement units must adhere to the various constituted policies for the encouragement of pig raising, and they may by no means capriciously change them. They must use every manner of means to do a good job of procurement work by promptly buying up all the fattened hogs that commune members want to sell. As regards problems such as refrigeration, freezing, and transportation, they must adopt a positive attitude and gradually solve them. When freezing facilities are insufficient, they should resort to salting and curing in order to preserve the pork till it can be sold. They should greatly cherish the hog raising enthusiasm of production teams and commune members, and under no circumstances should they restrict or halt procurement, deprecate quality in order to force down the price, or restrict raising of hogs simply because pigs are a little numerous, causing the enthusiasm of the masses for hog raising to be stifled. They should, in addition, devise means of opening marketing avenues and permit two courses of action. Once state procurement quotas have been satisfied, they should encourage commune members to slaughter hogs for their own consumption and for sale in rural markets. They should establish and perfect diverse systems of responsibility for production, operate additional collective hog farms, and continue to encourage commune members to raise hogs. They should promote superior breeds, promote livestock feed for the hogs, and work at scientific raising of hogs to increase the rate of pork production, thereby continuing the development of hog raising and production.

PREVENTING LOW TEMPERATURE, COLD DAMAGE TO CROPS DISCUSSED

Beijing NONGCUN GONGZU TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 5, 5 May 80 pp 17-18, and 28

[Article by Rao Xing [7437 5281], Director, Central Meteorology Bureau: "Master the Laws Governing Climate; Lay Scientific Plans for Agricultural Production:"]

[Text] China is located in the southeastern part of the Eurasian mainland. Its northwest plunges deeply into the continental heartland, and to the southeast it faces the boundless Pacific Ocean. This, plus a complex topography, results in a marked monsoon climate.

A monsoon climate has three major characteristics. One of them is four distinct seasons with wide variations in temperature. Summer temperatures in China are from 1 to 5 degrees higher than for places at the same latitude (except for deserts) in neighboring countries. In most places there are four distinct seasons, and differences between daytime and nighttime temperatures are from 5 to 6 degrees greater than for Japan or India. This is greatly advantageous to the growth of thermophilous crops such as paddy rice and cotton. A second characteristic is copious amounts of rainfall just at the crucial stage of crop growth. Summer rainfall as a percentage of year round precipitation is 50 percent in South China, between 50 and 60 percent in the basins of the Yangtze and Huai Rivers, and from 60 to 70 percent in North China, Northwest China, and the Northeast. Since the time of arrival each year and the strength of the monsoon varies, the amount of precipitation also varies. Consequently, partial or fairly extensive droughts or waterlogging can take place. This is a fly in the ointment. A third characteristic is great diversity in types of climates. China has semi-tropical, temperate, and frigid climatic regions, which are extremely favorable for the growth of all kinds of crops and for the development of agriculture.

In short, China's climatic resources are abundant and varied. Conditions for the development of agriculture are quite superior and offer a great potential. As for disasters caused by the weather, such as droughts and waterlogging, typhoons, torrential rains, hailstorms, high winds, and low temperatures that cause freeze damage, every country has them. China has devoted a lot of labor to the control of drought and waterlogging and to the capital construction of farmlands. Remarkable achievements have been made, and ability to prevent and combat calamities has been increased. Nevertheless, quite a few places are still dependent on the heavens for their food. This article concentrates discussion on cold damage and

low temperatures, because the extent of harm it does is greater than from other causes. As people say: "A swath is hit by hailstones, and drought or waterlogging covers a tract, but low temperatures and cold damage kill everywhere." Yet, if we will only change our farming system, respect science in our mix of varieties, and truly act in accordance with the laws governing climate, putting more effort and strength into guarding against low temperatures and cold damage, cold damage can be prevented and consistently high output can be obtained. I intend to present below some superficial views on this problem.

#### Harm to Agricultural Production by Low Temperatures and Cold in Different Areas

##### 1. Harm Done in the Three Northern Regions by Low Temperatures and Cold Damage

One crop per year is harvested on the Altai and Dacheng plains areas of the Northeast, Nei Mongol, Gansu, and Xinjiang. Under normal circumstances, accumulated temperatures are just sufficient for the varieties of crops currently being farmed and there is no room for maneuver at all. Consequently, if low temperatures occur at any time during the growth period, output will be impaired. In the Northeast and Nei Mongol, the laws governing the occurrence of low temperatures are virtually identical. The adverse effect of low temperatures during June and August are more noticeable than at any other time during the growing season. Output in Nei Mongol is more inconsistent than it is in the Northeast. When low temperatures occur, annual output declines by as much as 20 percent or more, and Nei Mongol is more prone to harm from early frost. In the Northeast, 1978 was the greatest bumper harvest year since the founding of the People's Republic, but an early frost occurred in August in Nei Mongol, which reduced output by more than 20 percent over 1977. If accumulated temperatures in the Northeast are 200 degrees lower than normal, grain output will decline by about 14 percent. If they are 200 degrees higher, grain output will increase by about 22 percent. In some parts of Gansu and Xinjiang, the threat from low temperatures is greatest during August and September. In the Altai and Dacheng regions, when average May and August temperatures are lower than 18.5 degrees serious reduction in rice output results. When average temperatures in September are lower than 15 degrees, corn yields are diminished; when they are higher than 16.5 degrees, yields increase. Secondly, in most parts of southern Liaoning, North China, and Xinjiang, accumulated temperatures are more than sufficient for the growth of one crop a year, but not sufficient for two crops a year. Low temperatures in June cause delayed ripening of the winter wheat. This not only affects summer sowing, but also affects the timely sowing of seeds for winter wheat. In Beijing, for example, should accumulated temperatures from late August until late September be greater than 845 degrees, output will be high from crops sown in summer, and they will be ready for timely harvesting. If, however, accumulated temperatures are lower than 845 degrees, output will be impaired, and harvesting of the late crop will be delayed, with adverse consequences for the timely sowing of seeds for winter wheat. In the Tarim Basin of Xinjiang, plantings of dryland cotton of a medium-maturing type will be assured sufficient warmth, but should long fiber cotton be planted instead, in some years reduced output will result from low temperatures. In the long fiber cotton growing region of South Xinjiang, if accumulated annual temperatures are greater than 4000 degrees and average September temperatures are greater than 19 degrees, increased output will result. When temperatures are less than this, output will decrease. In the dryland cotton growing region of North Xinjiang, when accumulated temperatures during May and September average more than 17.5 degrees, increased output may result; otherwise reduced yields may result.

2. Threat Posed by Low Temperatures and Cold Damage to Areas South of the Yangtze River Basin. Low springtime temperatures mostly threaten the growth of early rice seedlings. Seedlings are usually grown between late February and late March in South China, and between late March and late April in the middle and lower reaches of the Yangtze River Basin. If a bout with cold air occurs, action must be taken to prevent rotting of seedlings. According to statistics, from 1960 until 1978, the probability of low temperatures occurring during the seedling growing season in South China and in the middle and lower reaches of the Yangtze River Basin was greater than 30 percent. In 1976, mid March to early April temperatures in South China tended to be from 3 to 5 degrees lower than normal, causing the rotting of seedlings over wide areas, and a delay of about 15 days in the planting of the early rice crop. In recent years, the frequency of occurrence of low temperatures during June in the South China area has been greater than in the past. Daily temperatures have averaged less than 20 degrees, to the impairment of heading and blossoming of early rice. In the Yangtze River Basin, should daily temperatures during May average less than 15 degrees, the early rice crop will green up late, tillering will be less, differentiation of young panicles will be adversely affected, and reduced output will likely result. The occurrence of low temperatures during the heading and blossoming period of late crop autumn rice is popularly known as "cold dew wind." Generally speaking, average daily temperatures of less than 20 degrees over a period of from 3 to 5 days will interfere with normal pollination. At the present time, late rice grown in the middle and lower reaches of the Yangtze River forms heads and blossoms in mid September. Should there be a strong southward movement of cold air occurring in conjunction with a typhoon during this period, output will be drastically reduced. Low temperatures during winter principally imperil citrus and rubber. Generally speaking, citrus tolerant of cold will sustain damage at temperatures of from -7 to -9 degrees. At temperatures of from -10 to -11 degrees, cold damage will be serious or killing. The growing of rubber trees is also restricted by low winter temperatures. Places in China suitable for the growing of rubber trees include Xishuangbanna and Hainan Island, with test plantings in parts of Guangdong and Guangxi provinces. It is necessary, however, to select favorable U-shaped topography on the leeward side of slopes for planting, otherwise cold damage is likely to occur.

#### Defenses Against Low Temperatures and Cold Damage

People have gradually come to understand better : temperatures and cold damage in recent years. This is attributable to the following:

(1) Observation of climatic changes over large areas of China show that beginning in the 1950's and continuing to this day, the trend of temperature changes in the climate has been downward. Though changes in temperatures during this period have been from moderate to slight, the adverse effects of low temperatures and cold damage on agricultural production has become increasingly apparent. During the 1970's, damage from coldness and low temperatures averaged once every 3 or 4 years.

(2) The as yet incomplete understanding and mastery by the people of the laws of climatic changes, plus the sometimes inadequate planning of production has intensified the extent of damage from cold temperatures. In China's northeastern region, for example, where early and medium-maturing varieties used to be grown, a change was made during the 1960's to the promotion of medium and late-maturing varieties. In the northern part of North China, three crops were harvested every 2 years, but subsequently two crops every year were promoted. In the Yangtze River Basin, formerly a single crop of rice or two crops of rice and wheat were



grown, but later on two crops of rice were planted, because up until the time this was done, fullest use had not been made of heat resources and output was quite low. Adoption of these changes to the system are necessary, but in the process of changing the system, diligent attention must be given to the matching of crop varieties and to the intensification of field care. Unless this is done, little will be gained and much lost.

How can harm from low temperatures be reduced or entirely avoided? The most important rule is to plan agricultural production in accordance with climatic conditions. Action to both "prevent" and "avert" damage from low temperatures may be taken. "Averting" low temperature damage is most important, and it is also attainable. "Prevention" is an ancillary measure to be taken. In a situation in which the entire country has been divided into agricultural regions and climatic regions, the three northern areas of China must select matched varieties suitable to the local area. Selection of varieties for matching for which the rate of assurance of sufficient accumulated temperatures is 85 percent is quite suitable. In this way, consistent output and increased output for 85 years out of 100 may be assured. In the remaining 15 years, when accumulated temperatures are somewhat low, there will be either reduced yields or average yields. In years of high temperatures, yields will be bumper; in years of average temperatures, some increase in output will occur; and in years of low temperatures, yields will be reduced. Secondly, suitably early sowing to meet the crops' needs for heat may be done in an abbreviation of the period for sowing of seeds. By mixing together chemical fertilizer and barnyard manure, even and sturdy plants will grow and early tilling will take place in what the masses term, "born rich." Loosening of the soil and weeding in mid-season plus application of fertilizer at the right time is also effective in combating low temperatures. Prefectures to the south of the Yangtze River Basin should strive to achieve "three avoidances," namely, sowing of seeds for the early rice crop at the proper time so as to avoid the rotting of seedlings and low temperatures in June; keeping seedlings for the late rice crop in seedling beds long enough so they will avoid harm from the cold dew wind during heading and blossoming; winter planting must be done on time and harvesting must be done early to avoid delays in transplanting the early rice crop.

In order to achieve the "three avoidances" it is first necessary to do a good job in planning production for the entire year, making sure each link is closed and that all the links are closed together tightly. Sowing of early rice should be done first in seedling beds that face the sun and are out of the wind, and planting of seeds done at the end of the cold season at the beginning of the warm season when temperatures have stabilized at above 12 degrees. If early rice is sown too early during the season of low temperatures and numerous overcast and rainy days, not only are the seeds and the seedlings prone to rot, but the plants will also be exposed to low temperatures in June when they are strengthening, forming heads, and blossoming. For the late rice crop, attention must be given avoidance of harm from the cold dew wind.

Next is scientific matching of varieties. In Shunde County in Guangdong Province, for example, late crop variety "Guichao No 2," which has a 140 to 150 day growing season, was chosen for use as the early crop rice in 1978. Seeds were sown on 19 February, and seedlings were transplanted on the vernal equinox. In mid June, heading and blossoming took place, and harvesting was done at the end of July, the "dragon boat water" [around the 5th day of the 5th lunar month] thereby being avoided. For the late rice crop, sitting autumn variety, "Guichao No 2"

was selected. This variety has a growing period of about 110 days. Transplanted before the "beginning of autumn" (around 7 August), it formed heads and blossomed during late September and early October, thereby avoiding harm from the cold dew wind. For the entire county, average yields for both crops were about 1400 jin per mu. In another example, the Tonggu Production Brigade in Xinyi County harvested a bumper crop when output declined elsewhere throughout the county as a result of sensible matching of varieties.

Though the masses of peasants have abundant practical experience with changes in the farming system and the matching of varieties, there are also definite limitations in a generally fairly large safety factor. This is the primary tactic in the struggle against the heavens under current social conditions. We must summarize the experiences and the lessons of numerous years of changes everywhere in the farming system, and formulate a plan for matching varieties through the adaptation of methods to local situations that can be used in practice.

In summary, under present conditions, if we will simply be diligent about planning production in accordance with the laws governing climate, seek truth through acts in rational matching of varieties, intensify field care, look ahead with the past in mind, and do overall planning, we can harvest consistently high yields in agriculture.

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## HYBRID RICE SEED PROPAGATION WITHOUT USING SEEDBEDS FOR FEMALE PARENT

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER]  
In Chinese No 4, 15 Apr 80 p 2

[Article by Zhang Zhongliang [1728 0112 5328] of the Scientific Research Station of the Haifeng General Farm of Shanghai City: "Seed Propagation of Hybrid Rice Without Using Seedbeds for the Female Parent"]

[Text] In seed propagation of hybrid rice, the aftercrop for the seedbeds of the female parent is frequently difficult to arrange because of the great differences in the sowing times of the two parents when the female parent is sown 35 to 60 days later than the male parent. Especially in seed propagation over large connected areas, the problem of strict quarantine is outstanding, and some areas are even left to waste and not planted. To solve this problem, we conducted several experiments in seed propagation of hybrid paddy rice without first keeping seedbeds for special use by the female parents during the past 3 years and good results were obtained and the method has been popularized.

## 1. Seed Propagation in the Seedbeds of the Female Parent

Seed propagation in the seedbeds of the female parent mainly suits hybrid combinations whose male and female sowing times differ by 35 to 45 days, for example, the female parents with longer growth periods such as Shan you No 2, Shan you No 3, Wei you No 2 and Wei you No 3. The trenches in the seedbeds should be as narrow as possible, the most suitable width is 6 to 7 cun. The seedbed should be facing east-west (to facilitate pollination by wind). The width of the surface of the seedbed should vary according to the row distance of the female parent plants and the differences in the ratio of the rows of the female and the male plants. Taking a row distance of 5 cun for the female and a ratio of 1:6 between the male and female rows, the width of the surface of the seedbed should be 3.7 chi. The actually sown width of the female plants is 3.3 chi, as shown in figures 1 and 2.

Before sowing, a string is pulled across the north side of the seedbed 4 cun away from the trench of the seedbed and seeds are sown along this line as samples. Then the seeds are sown uniformly (do not sow seeds to the north of the line) and then the seeds are compacted. It is best to separately transplant the second or third group of male plants after 2 to 3 days and then clean the seedbed trenches once more.

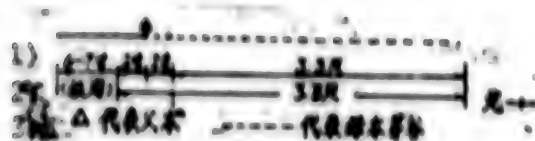


Figure 1. Illustration showing sowing of female parent plants, and male parent plants after transplanting

- Key: 1) 6-7 cun 2 cun 2 cun 3.3 chi  
 2) Trench of seedbed 3.7 chi North  
 3)  $\Delta$  represents male parents  
 ----- represents female budding seed grains

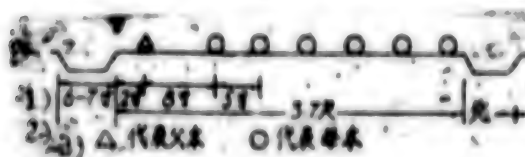


Figure 2. Illustration showing female parent plants after transplanting

- Key: 1) 6-7 cun 2 cun 8 cun 3 cun  
 2) 3.7 chi North  
 3)  $\Delta$  represents male parent  
 $\circ$  represents female parent

## II. Cultivating the Female Seedlings in Seed Propagation Fields

Female seedlings are cultivated in the large seed propagation fields of Nanyou varieties. This requires leveling the empty land in between rows of the transplanted male plants and preparing it as seedbed. The width of the surface of the seedbed varies according to the row distance between the male and the female plants and the difference in the ratio of the female and the male rows. Before sowing, strings are pulled along the south side of the seedbed 4 cun from the male parent plants (to facilitate operation) and 2 cun on the north side and samples are sown along these lines. The seeds are sown when the hardness of the seedbed is appropriate and the seeds are compacted in time to prevent damage by birds.

## III. Direct Sowing and Seed Propagation of the Female Parent

Transplanting the male parent plants and directly sowing the female plants for seed propagation can be further tested and popularized in places where land is plentiful and labor is short. Machine sown rice seeds should be forced to bud until the seeds show white. When packing the seeds by hand (hold the budding seed in the hand and apply some force to place half of the budding seed into the soil to help the seed root manually), the roots and buds should be longer. This prevents mud from covering the seeds and also prevents the seedlings from shifting.

The amount of seeds sown should vary according to the density of planting and the texture of the soil. Generally the amount used should be 5 percent more than the amount of seeds used for transplants in large fields. Because the tillering node of the directly sown rice plants is lower than those transplanted and because they do not have a period for returning green as transplanted seedlings have, therefore, the difference in the time of sowing of the male parent and the directly sown female parent generally is longer than that when both the male and female parent plants have been transplanted by 5 days. Otherwise, the flowering periods will not easily meet.

Management of water and soil of the three methods described above are basically similar. Before greening, the plants should be irrigated during the day and the fields should be drained during the night. After greening, a water layer should be maintained. This way will benefit the rooting of the small seedlings and will not hinder the normal growth of the male parent plants. The remaining measures of management are generally the same for seed propagation in large fields.

9296

CSO: 4007

## SOWING DRY, WET SEEDS SIMULTANEOUSLY RAISES CORN POLLINATION PERCENTAGE

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER]  
in Chinese No 4, 15 Apr 80 pp 8-9

[Article by Tang Chengwen [0781 2052 2429] of the Neijiang County Science Committee of Sichuan Province: "Sowing of Dry and Wet Seeds Simultaneously Raises the Percentage of Pollination of Corn"]

[Text] Corn is a monoecious cross pollinated crop. The natural crossing percentage is about 95 percent. Under high temperatures and low humidity, the percentage is only 65 to 80 percent or less. This is because male flowers blossom earlier than the female flowers and the flowering period lasts only 7 to 8 days. If the temperature at the time is higher than 32°C, the relative humidity is lower than 30 percent, the pollen will quickly die. The period between the time when the filament of the female flower emerges from the bract and the time all the filaments have emerged lasts only 4 to 6 days, and the second and third days after all filaments have emerged are the time when the strength of pollination and fruiting are the strongest. After 11 to 12 days the fruiting strength rapidly drops. The filaments of the central part and the base of the female spike of corn emerge from the bract first, then those above and below emerge. The filament at the tip of the spike emerges the latest. Frequently, the percentage of cross pollination is not high because of a deficiency of pollen during the latter period or deficient nutritive conditions, causing bare tips or "scattered favus corn" and yield is affected.

To solve the problem of the deficiency of pollen of corn, the major method is manually assisted pollination but this method requires a lot of work. In recent years, farmer technician Li Jigui [2621 0679 6311] of the Sujia Commune of Neijiang County in Sichuan Province developed a method to use dry and moist seeds for simultaneous sowing and allowed the flowering periods to miss. This method can also achieve the result of assisted pollination so that the female flower will be fully pollinated.

The method is to first soak part of the seeds of corn in hot water (water temperature 60°C) for 24 hours (while soaking, the water surface should be above the seeds by 2 to 3 cun). Afterwards, the moist seeds are sown simultaneously with the dry seeds that were not soaked. When sowing, the dry and moist seeds are sown in a row ratio of one to one, (i.e., sowing one row of wet seeds and sowing one row of dry seeds), or two to one (i.e., sowing two rows of moist seeds and

then sowing one row of dry seeds), or three to one (sowing three rows of moist seeds and one row of dry seeds). Although management is entirely the same after sowing, the soaked seeds will germinate early and will flower early. Six to 7 days after corn plants grown from the moist seeds head and flower, the corn grown from the dry seeds will have all headed and flowered, supplementing the pollen of the male flowers and providing an opportunity for the female flowers, especially flowers that have headed late to be pollinated, realizing naturally assisted pollination, and raising the fruiting percentage of crossed pollination. This reduced bare tips and "scattered favus corn" greatly and increased yield. In 1979, one to one sowing produced an increased yield of 6.5 percent, two to one sowing produced an increase of 13.9 percent, and three to one sowing produced an increase of 19.3 percent in yield.

9296

CSO: 4007

# PLANES USED TO SPRAY CHEMICALS TO PREVENT DRY HOT WIND DAMAGE

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER]  
in Chinese No 4, 15 Apr 80 p 6

[Article by Zhang Shujin [1728 2579 6855] of the Henan Provincial Administrative Bureau of the Chinese Civil Aviation Administration: "Trial Use of Airplanes To Spray Farm Chemicals To Prevent Damage of Dry Hot Wind to Wheat"]

[Text] Our bureau and the provincial agriculture bureau have cooperated closely in the first trial use of airplanes to spray petroleum growth stimulants and dihydrogen potassium phosphoric acid over large areas to prevent dry hot wind damage of wheat and visible increased yields were realized. The masses welcomed the measures.

Henan Province is situated in the central plains and is one of our nation's wheat producing regions. But dry hot wind damage of wheat has occurred seriously. It has occurred over 80 percent of the recent years and has directly threatened the yield of wheat. According to statistics of the past 23 years, severe dry hot wind damage has occurred 9 times, medium severe dry hot wind 4 times, and ordinary dry hot wind damage 7 times. After the middle 10 days of April 1979, many regions in Henan Province suffered seriously from dry hot wind damage. To support agriculture, seize bumper harvests during summer, our bureau dispatched eight airplanes to the suburbs of Zhengzhou City and the counties of Tongxu, Rongyang, Xihua, Anyang, Wenxian, Changge and Shangqiu. Over 450 missions were flown and spraying covered over 210,000 mu. After summer harvests, the provincial agricultural bureau held a discussion meeting on the prevention of dry hot wind damage using airplanes to spray chemicals. The meeting was held at the Zhengzhou airport. Everyone believed that the use of airplanes to prevent this damage was successful and visible results have been achieved in most of the regions.

There are two types of substances for the spray used by airplanes to prevent dry hot wind damage: one is dihydrogen potassium phosphoric acid produced by the Sarmenxis Henan Farm Chemicals Plant. The amount of spray used in the trial flights was 0.2, 0.25 and 0.3 jin per mu. The diluted liquid spray was 4, 5 and 6 jin per mu. According to statistics compiled by the 11 brigades that conducted airplane spraying operations in suburban Zhengzhou, 9 brigades realized increased yields, averaging a per mu increase of 30 jin. Jicheng Commune used the airplane to spray chemicals to prevent dry hot wind damage and realized a total increase



of 564,000 jin of wheat, the increase was 4.5 to 14.9 percent. This investment of an average of 0.65 yuan per mu calculated at 30 jin of increased yield per mu, minus the cost of investment, yielded a net profit of 3.55 yuan.

The other substance was the petroleum growth stimulant produced by the Hongqi Chemical Plant of Liuzhou in Liubo City, Shandong Province (containing 30 percent of effective cycloparaffin acid sodium). The amount of original chemicals sprayed by airplane per mu was 0.2 jin, the concentration of the spray was 25 times, 30 times, and each mu used 5 to 6 jin of diluted solution. According to the results of comparative experiments at 12 test points covered by spraying within the area of the spraying mission by airplanes in the 9 brigades (farms) of the 3 communes of Shangqiao, Puhu and Houhe and Changge County, visible increases in yields were realized at 8 test points within the area covered by airplane spraying operations. Per mu yield showed an increase of 20.3 jin over the controlled regions. Net profit per mu was 3.05 yuan. Throughout the entire county, the efforts to prevent dry hot wind damage by spraying chemicals by airplanes produced a total increased yield of 463,000 jin and an increased income of 69,500 yuan.

In general, regardless of which chemical compound was used as the spray for the airplane mission, highly effective and highly concentrated phosphorus and potassium compound fertilizer--dihydrogen potassium phosphoric acid, or the growth stimulant--petroleum growth stimulant, remarkable results of increased yields were realized. Using airplanes to prevent the dry hot wind damage is a new technique. It is highly effective, the results are good, it saves labor, conserves cost, and is very suitable for operation over concentrated and continuous wheat fields of large areas. In the future, it should continuously be promoted, popularized and used so that it can be improved and the experience can be summarized continuously in actual work.

9296

CSO: 4007

## FREE POLLINATION METHOD FOR RICE EXPLAINED

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER]  
in Chinese No 9, 15 Sep 80 p 15

[Article by Sun Kaiquan [1327 7030 6898], Ba County Agricultural Institute,  
Sichuan Province: "Free Pollination Method for Hybrid Rice"]

[Excerpt] Usually when people breed hybrid rice, they use either a writing brush or a pair of tweezers to pick up the pollen. The work is highly difficult; the speed is slow; and efficiency is low. One person is able to handle only a few hybrid combinations in a day. For the past several years, we have had very good results from the use of the free pollination method with hybrid rice. Its advantages are as follows: (1) A from three to five fold increase in efficiency over hand pollination. (2) With the use of one or several panicles of male parents for pollination, the quantity of pollen is large, the pollination area large, the time abundant, the pollen collection time short, and the vitality of the pollen vigorous, with the result that the fruiting rate is high, and the hybrid fruiting rate can be increased to 70 or 80 percent. (3) At the time of pollination, there is no impairment of the pollen from high temperatures, wind, rain, or such environmental factors.

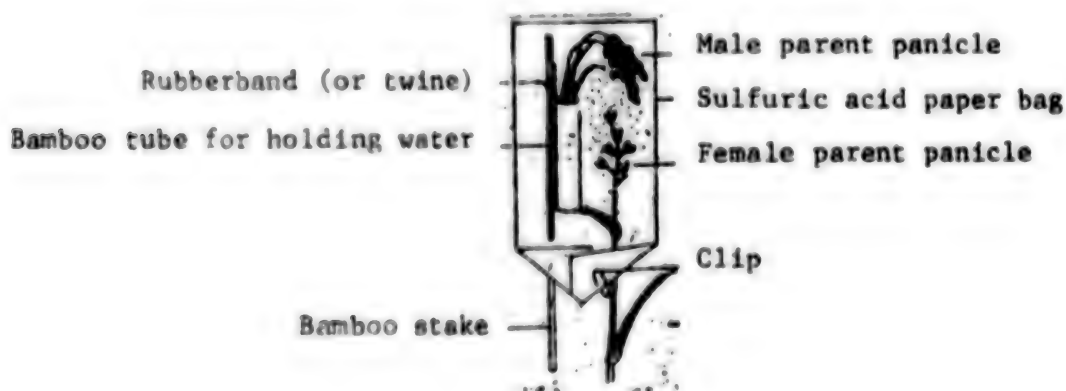


Illustration of free pollination

# GENTAMYECIN EFFECTIVE AS ANTICONTAMINANT FOR NURTURE OF ANTHERS

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER]  
in Chinese No 9, 15 Sep 80 p 13

[Article by Li Chaocan [2621 2600 3503], Rice and Wheat Institute, Fujian Provincial Academy of Agricultural Sciences: "Chemical Anticontaminant for Nurture of Anthers--Gentamycin"]

[Text] Bacteria and molds are the great enemies of tissue cultures, and they are currently the most frequently seen microscopic organism contaminating the cultures of paddy rice anthers, particularly during the summer season with its high temperatures and high humidity. The contamination rate in cases where bacteria-free control conditions are not so good is usually from 30 to 40 percent, and sometimes as high as 70 to 80 percent. This results in losses and waste of culture materials, and of human and material resources.

In 1978 and 1979, acting on the basis of successful experiences in the clinical application of antibiotics, and bearing in mind the characteristics of culturing of anthers in paddy rice, we selected some broad spectrum antibiotics fairly tolerant of high temperatures and high pressures, and that were fairly stable in the presence of light and acidity or alkalinity to conduct experiments in the control of contamination. The results showed gentamycin to be most effective in the control of contamination.

Gentamycin is sold for use in medical injections. Following dilution to a certain viscosity, it was put into the culture medium with a blank being prepared as a control as well. It was submitted to 15 pounds pressure for 15 minutes to kill the bacteria. Materials used in the experiments were nine combinations of the progeny of common hybrids and the F<sub>1</sub> generation of hybrid rice. Following disinfection and inoculation of the anthers, culturing was done following usual procedures.

Effectiveness of gentamycin: The results of 2 years of experiments show a striking decline in the statistical contamination rate 30 days following inoculation for both bacteria and molds, with a from 59.1 to 74.0 percent decline in the overall rate of contamination (Table 1).

Effects of gentamycin on culturing of rice anthers: In order to check on whether there were any adverse effects produced by the gentamycin in recovery

Table 1. Gentamycin Anticontamination Results

Year	Treatment	Inoculation Control		Bacteria Contamination		Mold Contamination		Total	
		Control		Control	Percent	Control	Percent	Control	Percent
1978 early crop	Control	45	10	22.2		4	8.9	14	31.1
	gentamycin 2 ppm	61	3	4.9		2	3.2	5	8.1
1979 early crop	Control	146	19	13.0		6	4.1	25	17.1
	gentamycin 5 ppm	114	7	6.1		1	0.9	8	7.0

Table 2. Comparison of Damaged Anther Tissue and Green Seedlings Conductance Rate

Year	Treatment	Number of		Conductance rate		Number of		Green seedlings	
		Anthers Inoculated	Healed Tissues	of healed ones (percent)	of healed ones (percent)	healed green seedlings	healed green seedlings	conductance rate (percent)	conductance rate (percent)
1978	Control	768	116		15.1	--	--	--	--
	gentamycin 2 ppm	875	141		16.1	2	2	2.3	2.3
1979	Control	7,676	379		4.9	9	9	1.1	1.1
	gentamycin 5 ppm	7,870	504		6.4	11	11	1.4	1.4

of damaged tissue or the conductance of green seedlings, 60 days following inoculation and 30 days following metastasis of the healed tissue, the healed tissue and the frequency of conduction of the green seedlings for each of the 9 combinations was checked with no apparent adverse results (Table 2).

Our experiment showed a desirable effectiveness in control of contamination when from 2-5 ppm of gentamycin was used in the culture of paddy rice anthers. Not only was effectiveness marked but there were no side effects as well. The Lianjiang County Agricultural Institute in Guangdong Province and the Ningde County Superior Varieties Farm used our method with equal effectiveness. In 1979, we used gentamycin in the culturing of endosperms of the late rice crop, also achieving quite good results in anticontamination.

9432

CSO: 4007

# WINTER RAPE DEVELOPED IN HUANG, HUAI JIANG REGIONS

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER]  
in Chinese No 9, 15 Sep 80 p 11

[Article by Yang Jingze [2799 4842 3419], Oils Institute, Chinese Academy of Agricultural Sciences: "Great Potential for Development of Winter Rape in the Huang Jiang and Huai Jiang Regions"]

[Excerpts] Within the past several years, the development of winter rape production has been very fast in Henan, in Yuncheng Prefecture in southern Shanxi, in Fuyang Prefecture in north Anhui, in Liaocheng and Heze Prefectures in Shandong, and in Xuzhou Prefecture in northern Jiangsu (i.e. at between 32 and 35 degrees north latitude). These are newly developed winter rape areas. During May of this year, the writer began a preliminary survey in those areas where I made onsite visits, held discussions, and conducted examinations of the fields. The vast prospects of this region for the development of rape production impressed me deeply. The potential here is great for the development of rape production.

Prior to 1970, the area of southern Henan Province sown to rape amounted to only from 20,000 to 50,000 mu. In 1980, the area harvested amounted to 3.5 million mu (6 million mu was sown, but more than 2 million mu froze to death), which shows how fast the area sown to rape expanded. As another example, Fuyang County (north of the Huai River) in northern Anhui began to grow rape in 1974. In 1979, it grew 92,000 mu of it, and by 1980, this had increased to 150,000 mu, with projected per unit yields reaching around 100 jin.

In the Huai River area, not only was there rapid growth in the area sown to rape, but rape also gradually came to be the first crop in a two crop system of farming there. The system changed from the previous one of a single crop a year (one crop each year of spring corn, or cotton, or sweet potatoes) to two crops each year or five crops every 2 years. The major systems of crop rotation were as follows: (1) A two crop system of grain and rape: winter fallow + spring corn (or spring sweet potatoes). (2) A two crop system of cotton and rape: winter fallow + cotton--rape (sown directly) transplanted + cotton. Additionally, there was rape + sesame, or rape + tobacco in two crop systems. After several years experience, it was generally felt that these crop rotation systems were good ways to husband the soil's fertility while



combining soil use with soil nurture, and to increase income. In this region, much land lies fallow during winter. According to statistics, Henan Province has more than 20 million mu of fallow land in winter, and Funan County has 330,000 mu. In addition, large areas of the plains of the Yellow, the Huai, and the Hai rivers are saline and alkaline from which the output from growing of rape is higher than from the growing of wheat, and so the masses are now quite happy to grow rape. From this may be seen that the area of the Yellow and Huai rivers may very well become China's major new rape producing area.

1432

CSO: 4007

## BRIEFS

**FUJIAN DISCUSSION MEETING**--A provincial discussion meeting on agricultural modernization, ecological balance and agricultural scientific dialectics was held in Fuzhou in late October. The meeting received 280 reports and 29 professors and experts read their report during the meeting. The meeting was divided into 13 groups to study different subjects centering on agricultural modernization and ecological balance. The meeting also discussed how to speed up agricultural production in Fujian Province. [Fuzhou Fujian Provincial Service in Mandarin 1035 GMT 5 Nov 80 HK]

**FUZHOU INDISCRIMINATE LUMBERING**--The Fujian Provincial People's Government recently issued a report prohibiting indiscriminate lumbering in the province. The report said: the indiscriminate lumbering situation has been getting quite serious recently, and forest resources have been seriously sabotaged. This will in turn affect the ecological balance, the progress of the four modernizations and the people's livelihood. The report demanded that: 1) all places must work in accordance with the state's timber production quota and must not exceed the quota; 2) people's governments at all levels must organize forces to inspect timber production and insure that it is in accordance with the state's quota; 3) departments other than the forestry department are not allowed to lumber in the forests and procure timber; 4) it is forbidden to fell young trees and those who violate the regulation must be severely punished; 5) it is necessary to strictly follow the transportation management method stipulated by the provincial people's government; and 6) it is necessary to justly settle disputes concerning lumbering. [Fuzhou Fujian Provincial Service in Mandarin 1035 GMT 3 Nov 80 HK]

**AGRICULTURAL SEMINAR**--A Fujian provincial seminar on agricultural modernization and ecology was held recently. All participants at the seminar pointed out that forest resources have been seriously sabotaged by indiscriminate lumbering. They held that: 1) it is wrong to put the blame on the masses because the leaders should have exercised leadership over them; 2) the present indiscriminate lumbering directly affects the progress of the four modernizations. There are now only 8,900 cubic meters of timber left in the province and some 2,000 cubic meters are scheduled to be cut down later this year. Thus, in a few years, the paper mills and hydroelectric power stations will have to stop functioning since there will be no more trees. The problem is serious; 3) we must immediately change this situation. [HK101402 Fuzhou Fujian Provincial Service in Mandarin 1035 GMT 27 Oct 80 HK]

CSO: 4007

## NEW POLICY TO STIMULATE SUGARCANE PRODUCTION ANNOUNCED

Guangzhou NANFANG RIBAO in Chinese 20 Sep 80 pp 1, 4

[Article: "Important Policy Toward Increasing Cane Sugar Production in This Province"]

[Text] The Guangdong Provincial People's Government recently published a document announcing a new policy concerning production and procurement of cane sugar for the next 5 years. This is an important decision. It is beneficial in the sense that it is capable of mobilizing the people's initiative sufficiently to accelerate sugarcane production. It is beneficial because it is capable of rationally readjusting the structure of agriculture and increasing the income of the commune members. It is beneficial to the nation because it is capable of encouraging people to make a greater contribution to the nation. It is expected that the leaders at every level will quickly propagandize this policy among the commune members, and conscientiously implement this policy in order to mobilize them to firmly grasp this fall's planting season to plant more sugarcane according to what the local circumstances dictate. By doing so, they are to lay down a firm foundation for a significantly increased harvest of sugarcane and production of cane sugar during the next pressing season.

This province is endowed with conditions favorable to the development of cane sugar production. The natural conditions of Guangdong belong to the tropical or subtropical climate zone where sugarcane can grow fast with high sugar concentration. This kind of favorable conditions are seldom found elsewhere in this country. In spite of this, the sugarcane production per unit area in this province is still quite low today; only about 3 tons per mu on average, but with a great potential for growth. As to the sugar refining facilities, there are altogether more than 130 sugar refineries in this province, with 30 percent of the production capacity yet to be utilized. The potential in this area also provides favorable conditions for the development of sugarcane production. As to the technical force and the production experience, this province has a long history of sugarcane cultivation, and it is known and honored as "the home of sugarcane." It is one of the important sugarcane production bases of this nation. The masses have accumulated valuable experiences over the years necessary for achieving high productivity. Since Liberation, a troop of specialists meeting a certain level of standards has also been cultivated. Because Guangdong Province is in possession of these outstanding advantages at a time when the economic value of cane sugar is high and the demand for sugar by the people as well as the nation is also growing very rapidly each day, it is time for Guangdong to reorganize the structure of its agricultural

economy and aggressively develop its sugarcane production by taking full advantage of the natural law and the economic law. The new policy on production and procurement of cane sugar published by the people's government at this time is in complete harmony with the actual circumstances of Guangdong. It is also in agreement with the policy of the Party Central Committee and with the individual profit of the masses of this province.

The new procurement policy concerning cane sugar is in general as follows. The basic rule which is applicable over the entire province reads: "The base figures for sugar and grain production have been determined. Production in excess of the base figure will be rewarded; a ton of grain for every ton of sugar; and deficiency, punished likewise. This rule is to be applied over the next 5 years." (This rule shall be referred to as "exceeding the base figure, a ton of grain for every ton of sugar" for short hereafter.) The objective of this new policy is to mobilize the initiative of the vast majority of the commune members to plant more sugarcane, to increase the commodity rate of cane sugar, and to bring more profit to all three sides, including the nation, the collectives, and the individual commune members. In addition to the regulations concerning such matters as nitrogen fertilizer being sold preferentially to whoever satisfies the base figure of sugarcane procurement, bonus to be given in addition to the set price, the profit made by the sugar refineries to be returned in part to the cane growers, and the sugar that may be retained for personal use, the new policy includes a clause which states that a ton of grain will be awarded to whoever produces sugarcane in excess of the base figure of such amount equivalent to a ton of sugar. At this juncture, whether the base figure determined by the government is reasonable or not, or whether it is feasible to achieve overproduction, has a very important significance. Speaking in terms of the entire province, the base figure for sugarcane production for the 1981-82 pressing season is 20 percent less than that for the 1980-81 pressing season, or 5.2 percent less than the tentative base figure decided during the August meeting of the Provincial Sugarcane Production Conference this year. This way, not only may "the contradiction between sugar and grain" find solution, but the local units can also achieve, through their effort, overproduction and win award. Moreover, the base figure is applicable for the next 5 years. It shall not be altered no matter how much overproduction may be achieved, in order to encourage overproduction. Many areas have reflected that there are great potentials for increased sugarcane production so long as the policy is carried out conscientiously. The sugarcane production can be significantly increased; in fact, far greater than the base figure that has been published if each area will do according to what the local circumstances dictate and implement the multifaceted combined productivity responsibility system.

In cashing-in the award of "a ton of grain for every ton of sugar," different areas may adopt different methods of accounting. Some areas may use the production team as the accounting unit; others, an entire area. After repeated study with up and down, the majority of the areas and the suburban districts have decided to use the production team as the accounting unit. That is to say, that each production team will receive the award of "a ton of grain for every ton of sugar" according to its overproduction above and beyond the base figure, regardless of how other production teams of the same area may have done. This way, each production team will be aware of its situation at all time so that they may feel the task more challenging and work more diligently in order to achieve overproduction and win the award as much as possible without the fear of being "pulled back" by the

teams with lower productivity. The provincial people's government has also published special regulations based on the special circumstances of certain areas, allowing these areas to contact the provincial government directly with matters concerning accounting and cashing-in of the award related to "production in excess of the base figure; a ton of grain for every ton of sugar," (the regulations concerning encouragement within the base figure remain the same with the rest of the province) in order to facilitate drafting a practical and concrete regulation according to the special local circumstances so that the commune members of these areas may be equally motivated.

At the same time the award based on the overproduction is being implemented, the policy has also spelled out clearly that those units which do not meet the base figure production requirement must sell grain to the government in place of sugar. (Loss of production due to natural disaster shall be exempted from this regulation after investigation and approval.) This type of regulation, having both award and punishment, is expected to strengthen the sense of responsibility of each production contract, and to encourage and urge each production team to exert themselves to accomplish the sugarcane production plan and more.

The policy states clearly that a portion of the profit made by the nationally operated sugar refineries shall be returned to the sugarcane producers. This measure is expected to demonstrate a significant, positive action both politically and economically. It is expected to increase the income of the commune members. It is expected to strengthen the tie between industry and agriculture. It is further expected to increase the initiative of the commune members who will supply more and better raw material for the sugar refineries with greater self-confidence. With an increase in the amount of sugarcane supplied by the farmers, development of the cane sugar industry can be guaranteed. At the same time, the nation's financial income can be increased, benefiting the nation as well as the people. It is expected, therefore, that all concerned departments will understand these principles and will implement this new policy conscientiously and thoroughly. The work related to return of profit to the people involves many areas of consideration. Investigation and study must be carried out carefully by the joint industry-agriculture coordinating committee consisting of persons representing both sugar refineries and communes and production teams. They must negotiate cooperatively in order to determine a plan which will protect the profits of all sides concerned, including refineries, production teams, and the individual commune members. They must strive to equalize as much as possible the profits returned to the adjacent sugarcane growing areas in order to facilitate making plans for the assignment of sugarcane growing areas to each sugar refinery.

This fall's sugarcane planting season has begun. The leaders at every level must carry out his production plan and work related to implementation of the new policy according to the published policy and base figure. Above all, he must widely propagandize the new policy and, at the same time, quickly bring the production plan and the base figure to the production team through the contract signed by both sides--the refinery and the production team. Making arrangements for the areas in which to plant sugarcane requires an overall consideration. Each area must take care of both grain and sugar production according to what the local circumstances dictate, and strive to achieve a full harvest for both grain and sugarcane.



JOINTLY-MANAGED MILK PRODUCTS COMPANY ESTABLISHED

Guangzhou NANFANG RIBAO in Chinese 21 Sep 80 p 1

[Article by Shan Baiping (0830 2672 1627): "Guangzhou Milk Products Company Managed Jointly by the Agriculture, Industry, and Commerce Established"]

[Text] The Guangzhou Milk Products Company managed jointly by the agriculture, industry, and commerce was established officially yesterday in order to engage in a specialized production and to practice joint management.

Those units which participate in this joint venture include the following three: Guangzhou Municipal Stock Farm, Shizhou Stock Farm, and Guangzhou Municipal Milk Company. Jointly, these three units employ more than 2,500 workers belonging to the whole people ownership system and more than 3,400 workers belonging to the collective ownership system; possess a total ground area of more than 6,160 mu; own 2,187 milk cows and 625 milk sheep; and produce nearly 10 million jin of milk annually, amounting to 42 percent of the total fresh milk production in the municipality. Since the beginning of this year, under the unified leadership of the Guangzhou Municipal Agricultural Bureau, they have started a trial joint management. After a half year's effort, the three units jointly accumulated 748,000 yuan of profit, which was 143 percent more than the same period last year. They have thus demonstrated preliminarily the superiority of the joint management.

The newly established milk products company was able to provide unified leadership to the various specialty fields, processing plants, and business departments to make rational assignment of personnel, finance and materials, and to achieve systematic and coordinated operation of the production, supply, and distribution. Accounting was carried out at the three levels, including the company, the factory, and the area (team) or plant (store). The financial affairs at each level was undertaken independently in order to expand the right to independence of each basic production unit.

9113  
CSO: 4007



SHORTAGES OF HARVESTERS REDUCES GRAIN YIELD

Beijing NONGCUN GONGZU TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 5, 5 May 80  
p 12

[Article excerpted from survey data of the Agricultural Economy Institute, Chinese Social Science Academy: "Shortage of Harvesters in Heilongjiang Province")

[Text] The conflict between machine sowing and harvesting on people's communes in Heilongjiang Province is conspicuous. Mechanized sowing of large areas permits the crop to ripen all at the same time, while sowing by hand would result inevitably in untimely harvesting, causing losses in dropping of grain. Statistics show that in 1978 people's communes throughout the province had 2200 combines, each one handling 58,000 mu of cultivated land when, in fact, each combine took care of only 3000 mu at most. A very great difference indeed. Because harvesting was not done on time in 1979, a loss of from 700 million to 800 million jin of wheat resulted throughout the province. Because harvesting was not done on time in 1979 in the Changan Production Brigade of Changan Commune in Fujin County, the soybeans dried and cracked open. Spot checks showed 47 beans dropped per square meter for a loss per xiang of 500 jin of soybeans. In 1979, two management bureaus for state farms in Beian lacked combines at harvest time, as a result of which rains damaged 140 million jin, reducing yields by 80 jin per mu. As of the end of 1979, not all the wheat had been harvested in Heihe Prefecture for an estimated loss of more than 100 million jin. According to a briefing provided by units concerned, if timely action is taken to bring in the harvest on time, each combine can reduce losses by 50,000 jin, and additional yields of 30 jin per mu may be harvested, which is equivalent to a 15.4 percent increase in output.

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# GRASS ROOTS LEVEL CADRES' COMPLAINTS AIRED

Beijing NONGCUN GONGZUO TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 3, 5 Mar 80  
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[Article by Yiyang Prefecture CCP Committee Office: "Proper Handling of the Problem of Cadres 'Laying Down the Burden'"]

[Excerpts] In Yiyang County in Hunan Province, the Shiqiao Commune CCP Committee zeroed in on the problem of grass roots level cadres wanting to lay down their burdens and, after much work, solved the problem quite well.

In 1979, once autumn was over, 28 people in the 89 production brigade CCP branch committees of the commune wanted to lay down their burdens, and three people were determined to serve no more. Those wanting to lay down their burdens amounted to 45.3 percent of the 128 brigade chiefs, and those who had already put their burdens aside amounted to 24.7 percent. An analysis of their reasons showed three main ones as follows:

They had not sufficiently studied the line, program, and policies of the Third Plenary Session of the 11th Party Central Committee and the Second Session of the Fifth National People's Congress. Their grasp of these matters was not deep; their ideology had not kept up with the shift in work emphasis, and it was not in keeping with the development of a new situation. They felt their work was difficult, the masses hard to manage, and the life of a cadre difficult. They said, current policies are new, and methods are new; they're hard to grasp and figure out. Some said that a drum gets hit on two sides, but we grass roots level cadres get hit from three sides if we don't do a good job: our superiors criticize us; the masses oppose us; and our families grumble against us. Some also felt that now that the masses have a lot of democracy, they not only cannot be criticized but one cannot even speak a stern word to them. If one tries to figure out ways to handle the wrongheaded ones, the work doesn't get done. Fifty percent of the grass roots level cadres who wanted to lay down their burdens had such notions.

Second, when they saw that the party's policies were good and that people were free to operate household sideline occupations and tend private plots, and that while commune members were reaping benefits, cadres were getting little, they felt they were suffering economic hardships. When some production team chiefs saw that some commune members could make as much as 40 or 50 yuan in income from household sideline occupations, they said: If I were not a team chief but could do as I pleased, I would be rich quicker than anybody. Thirty-five percent of the grass roots level cadres who wanted to lay down their burdens had this as their reason.

Third was waiting to be elected. A minority of the comrades thought about how team chiefs were elected each year and how if the masses did not like them and didn't elect them, they would suffer loss of face, so early resignation would be preferable. They said that if the masses would just elect them, they would continue to serve.

Some individual cadres were, in fact, old, physically weak, and not able to do much, or else they had numerous shortcomings or had made many mistakes in their work. They lacked prestige among the masses and truly were unable to carry on.

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## BRIEFS

SUMMER GRAIN PROCUREMENT--By 10 October, Jiangxi Province had procured 2,559 billion jin of summer grain, 98.5 percent of the procurement quota. Forty-eight counties and municipalities, including counties in Yichun, Shangrao, Fuzhou and Jian prefectures and Jingdezhen and Pingxiang municipalities, have overfulfilled their quotas for summer grain procurement by some 98 million jin. [Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 30 Oct 80 HK]

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## JILIN

### JAPANESE EXPERT AIDS IN INCREASING RICE PRODUCTION

Beijing NONGCUN GONGZUO TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 3, 5 Mar 80  
p 26

[Article collated by Chinese Agricultural Society: "Japanese Expert's Experiences With High Output Test Plantings of Rice in Jilin"]

[Excerpts] The Sino-Japanese Northeast Rice Crop Technological Exchange Group, headed by rice expert Minoru Tanaka, went last year to Gongzhuling in Jilin Province for the mechanized test planting of 150 mu of high output rice by the Rice Institute of the Jilin Agricultural Academy. Statistics from October last year show that this tract of rice averaged yields per mu of 1,067 jin, which was twice that produced by the neighboring Dayushu Production Brigade, and 33 percent higher than the output of the Rice Institute of the Jilin Provincial Agricultural Academy. The plot with highest output had per mu yields of 1250 jin.

During mid and late April last year, during the period of seedling growth, temperatures below 0° C occurred on several occasions, and in August and September, during the stage of heading and coming into milk, average air temperature was 2° C lower than usual. To have had large area high yields under such abnormal circumstances demonstrated the success of this experiment. Minoru Tanaka, the group leader, was, however, by no means satisfied. He said that during the first year of test planting, because of unfamiliarity with the local climate and soil conditions, one could get only 60 percent success. He hoped for better results from planting in another year.

The Japanese rice growing techniques are quite suited to the requirements of the modernization of rice production in China's northeast. Observers and comrades from the rice institute who accompanied the Japanese expert had a few observations to make as follows:

First, high rate of mechanization and a saving in labor. Planting of a mu of paddy rice using our old methods required 20 man days whereas the Japanese method required only 40.4 hours or a total of 5 man days. Mr Minoru Tanaka said that given familiarity with machines and an increase in worker enthusiasm for work, work efficiency could be increased. In Japan, planting of 150 mu of paddy rice requires only the labor of a man and wife plus a child (half labor).

Second, a saving in seeds. Japan uses precision sowing with about 5 jin of seeds being sown per mu (locally 25 jin were used).

Third, costs are not high from a long-range point of view. For 150 mu of land, about 15 million Japanese yen would be required for the purchase of machines and equipment. Converted into renminbi, this is 77,000 yuan annually for a value of 7600 yuan. Two thousand fewer workers would be required, amounting to 3000 yuan for a total saving of 10,600 yuan. Within 7 years the capital investment for machinery could be amortized. If well maintained, most tractors, rice transplanters, harvesters, and drying machines will last for at least 15 years, which is favorable in long-range terms. If tractors, planters, dusting machines, combines, and dryers were to be depreciated over 10 years, and plastic sheeting, seedling trays, string bags, and plastic frames [1441 7893 7539 2665] were to be depreciated within 2 to 5 years, plus chemical fertilizer, seeds, insecticide, water and electricity, labor... etc., the cost of production of 1 jin of rice would be .143 yuan. On the basis of the current purchase price of .174 yuan per jin, plus the price of rice straw (.03 yuan per jin), a profit of 60 yuan per mu could be realized. If a 50 percent increase of price is added for state purchases of excess rice, i.e. .026 yuan per jin, the profit would be 103 yuan.

Reasons why they obtained high output through the use of Japanese methods in the cold land of Jilin Province:

First, they selected superior varieties.

Second, they were careful with their technique of fertilizer applications.

Third, seedlings were grown early and they grew sturdy seedlings, with the emphasis on early.

Fourth was early transplanting and sparse transplanting.

The frost-free season in North China's rice growing area is short, and low temperatures with cold damage are the principal obstacle to high and consistent output of rice. By studying Japanese experiences with the growing of rice, and by using advanced techniques, this disadvantageous condition may be overcome.

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## MEASURES ADOPTED TO PROTECT ANIMALS IN WINTER

SK130204 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 11 Nov 80

[Text] According to our sources, in struggling against natural adversities to protect animals, pastoral localities throughout Nei Monggol Autonomous Region have discarded their past practices of paying no attention to economic results and objective conditions and leaving a large number of animals to die in the winter-spring period. They are determined to protect animals unable to survive the winter and to concentrate their efforts on feeding fertile female livestock and breeding animals this winter and spring according to how much fodder grass is available.

The fattening of livestock in many areas is inadequate because of the prolonged dry spell in the region this year. Some localities suffer from a serious shortage of fodder grass, causing severe difficulties for animals in the winter and spring. In coping with natural adversities in the past, they usually have bought fodder grass from outside areas or herded their animals onto distant grasslands. This has not only cost a great deal of manpower, materials and funds but also has been detrimental to the animals. According to recent statistics, the per-year average number of animals dying as a result of shortages in the winter-spring period in pastoral areas throughout the region is 2 million.

This year various localities have summed up experiences and have decided to do what is possible to combat natural adversities and protect animals. Efforts have been made to set livestock herds according to the amount of fodder grass available and in line with the capacity of their grasslands. Regarding animals unable to survive in winter, various pastoral localities have sent 1.98 million head to some agricultural production areas, mountainous areas and a number of old revolutionary bases. The remainder have been slaughtered. The number allocated and slaughtered is 3 million head over that of 1979. In this way, not only the burdens of pastures, livestock pens and manpower are reduced, but also more than 100 million jin of fodder grass is saved. Thus, these pastoral localities are able to concentrate their efforts to protect fertile female animals, breeding animals and good breed animals successfully and to increase commune-brigade incomes.

CSO: 4007



## AGRICULTURE ADVANCES UNDER INFLUENCE OF 11TH PCC DOCUMENTS

Beijing NONGCUN GONGZUO TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 4, 5 Apr 80 p 7

[Article by Party Branch, Dazhai Production Brigade, Xiyang County: "Advancing Along the Road of Thought Liberation"]

[Excerpts] In 1964, following Chairman Mao's call, "In agriculture, learn from Dazhai," under the supervision, urging, and encouragement of the people of the entire country, we made progress, and we also made mistakes and learned profound lessons. Following the Third Plenary Session of the 11th Party Central Committee, we linked the historical lessons of experience, criticized ultra-leftism, purged pernicious influences, healed internal wounds, and diligently held fast to the spirit of the Third Plenary Session of the 11th Party Central Committee and its two documents on agriculture. Agricultural production saw further development.

In 1979, total grain output for the entire production brigade was 908,890 jin from yields of 1290 jin per mu, an increase of more than 20 percent over the previous year. Total income from agriculture, forestry, livestock raising, and sideline occupations amounted to 272,373 yuan, a 47 percent increase over the previous year. Disbursements to individuals averaged 212 yuan for a 15.8 percent increase over the previous year. Distributions of grain to commune members for their consumption amounted to 556 jin, an increase of 7.1 percent over the previous year. Total accumulations for the year amounted to 54,479 yuan, or 20 percent of total income for a per capita average of somewhat more than 100 yuan. Grain sales to the state totaled 660,000 jin, or average per capita sales of 1419 jin. Grain reserves amounted to 200,000 jin for an average 2222 jin per household.

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## PLANS FORMULATED FOR AGRICULTURAL MIDDLE SCHOOLS

SKDB1421 Tianjin City Service in Mandarin 0030 GMT 8 Nov 80

[Text] The municipal agricultural and cultural committees recently transmitted to rural county people's governments a report by the Municipal Education Bureau on a draft plan for successfully running agricultural middle schools. The committees urged all localities to firmly correct the irrational secondary education structure and steadily improve agricultural middle schools in line with actual conditions to avoid sudden great upswings and downswings in the quality of such schools. They called for efforts to solve in a down-to-earth manner all problems blocking development of agricultural middle schools and to accelerate reform of the rural secondary education structure.

The draft plan stipulates: agricultural middle schools, which combine general study with professional technical education, are an important part of rural secondary education. Agricultural middle schools should open both general knowledge and professional technical courses and establish small farms, nurseries or livestock areas, small plants or other experimental production bases to meet the needs of their professional technical education. Agricultural middle schools should follow the principle of emphasizing teaching. They must not arbitrarily stop any classes, or arbitrarily increase students' time devoted to manual labor. Departments outside the schools should also avoid assigning labor tasks to schools without authority.

The draft plan also states: agricultural middle school graduates must be placed in proper jobs. Such graduates may apply for college entrance examinations, especially for agricultural colleges. Commune-run plants, farms and tree nurseries are encouraged to give priority to agricultural middle school graduates when recruiting workers.

The draft plan urges all pertinent departments to help in turning agricultural middle schools into important bases for agrotechnical training activities and for training qualified agrotechnicians.

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CONFERENCE URGES PROCUREMENT OF EARLY RICE SEED

Hangzhou ZHEJIANG RIBAO in Chinese 21 Aug 80 p 1

[Article by Lu Shouchang [7120 7445 2490], Baochuang Commune]

[Text] in view of the continually overcast and rainy weather and some molding of paddy rice, every echelon of leadership should give a high degree of attention to and take effective action in the selection, retention and care of fine seeds from the early crop of rice.

The Provincial Agricultural Department and Grain Department recently convened an urgent conference on seed work to make arrangements for the performance of these tasks in each jurisdiction. The conference emphasized self-reliance in every locale in the selection and retention of sufficient amounts of early rice crop seeds. Places not so hard hit by calamity should purchase some superior seeds to make up for any shortages. Departments concerned should actively procure and organize timely inspections to do a good job of exchange tasks.

In order to encourage communes, production brigades, and state farms to sell more superior and reserve seeds to the state, the conference also studied and adopted suitable economic measures to increase award sale standards for chemical fertilizer.

Baochuang Commune in Yin County has given active support to fraternal communes and production brigades that have endured calamities, providing 110,000 jin of superior seeds from the early rice crop to Panhuo Commune. As a result of this year's damage from bacterial blight, Panhuo Commune's seeds for next year's early crop was a problem, and comrades in charge at the commune requested help with 110,000 jin of superior seeds from the Baochuang Commune. The Baochuang Commune immediately designated the Hengshan and Tongqiao production teams and the commune seed brigade responsible for selecting and retaining Luai No 4 seeds for the Panhuo Commune. After the cadres and commune members of these three brigades had accepted the task, they organized special units and special personnel for harvesting and drying, and they stored the seeds separately, taking good care of them to make a contribution to their fraternal commune and brigades' quest for a bumper early rice crop next year.

## HEAVY RAINS CAUSE SERIOUS FLOODING IN JIAXING

Hangzhou ZHEJIANG RIBAO in Chinese 20 Aug 80 p 1

[Article by Shao Chang [6730 2512] and Zhang Yongchang [1728 3057 7022]]

[Text] Torrential rains have fallen in Jiaxing Prefecture for several days in a row. At 11 of 14 major hydrological stations, the water level has risen above the alert line, and the water level of Tai Lake is 0.12 meters above the alert line. Statistics from the seven counties of Jiaxing, Wuxing, Deqing, Changxing, Tongxiang, and Haining show a waterlogged area of 2,015 million mu. The just planted late rice crop is afloat, and lodging of plants is quite serious. Fifteen communes in Jiahan County have river water covering their fields.

The Jiaxing Prefectural CCP Committee and the prefectural administrative offices have called upon the people of the entire prefecture for urgent mobilization to overcome the flooding and waterlogging, and to care for the late rice crop. Prefectural and county leaders concerned have hurriedly gone to the front lines to direct combat against the disaster. Jiaxing County has closed 400 sluice gates, and erected 100 earthen embankments. A total of 693 electrically operated drainage and irrigation machine stations and more than 200 pumping machines have gone into operation at once. More than 10,000 commune members are working shifts night and day to effect drainage. Materials departments in Jiaxing County have also rapidly organized forces, moving 120 tons of diesel fuel, 4100 pieces of mao bamboo, and 28 cubic meters of timber for use in combating the disaster to the flooded areas and to threatened embankment work sites. Electricity supply departments have given priority to the supply of electricity for draining of water. As of yesterday, water had been pumped from more than 200,000 mu of farmlands in this county. In both Wuxing and Deqing counties as well, active efforts are also underway to rid fields of accumulated water and intensify care over the late rice crop.

Even while the broad masses of cadres and commune members in Jiaxing County are devoting all their efforts to combating disaster and draining the water, they have stimulated the masses to adopt urgent measures to save the paddy rice from heating up and the possibility of molding, in an effort to reduce the damage to the absolute minimum. The 15 drying machines belonging to the country grain department had already dried 15.12 million jin of paddy rice as of 17 August. Thirty communes have already taken 35 million jin of paddy rice to the homes of commune members to be used for consumption by commune members and for animal feed. In various places 21 cocoon stations as well as cement plants, the underground flues in silkworm sheds, and iron stoves have been used for the direct drying of more than 4 million jin of paddy. Materials, grain and electric power departments have also actively joined in the combat against disaster to protect the grain. They have rapidly allocated 400 tons of coal, 200 tons of coal briquets, and 250,000 jin of rice hulls for use in drying the paddy rice.

## AID GIVEN FOR LIVESTOCK PRODUCTION IN MOUNTAINOUS COUNTIES

Hangzhou ZHEJIANG RIBAO in Chinese 26 Aug 80 p 1

[Article by Wang Yichun [3769 5902 5028]]

[Text] The Provincial CCP Committee and the Provincial People's Government have taken effective action to use capital, materials, and technology for the active support of 25 mountain area counties in developing their herbivorous livestock production. As of the end of June, these 25 counties had 420,000 head of beef cattle, 500,000 head of sheep, and 2.76 million rabbits for an increase over the same period last year of 2.26 percent, 15.3 percent, and 40.8 percent respectively.

A survey by departments concerned showed that there are 11.67 million mu of grassy slopes on mountains in the wilds of these 25 counties, and there is an additional large amount of forest grass. Pasture grasses are abundant for the development of beef, sheep, and rabbit production. Acting in accordance with the spirit of two documents from the Central Committee on the development of agriculture, the Provincial CCP Committee last year decided to adopt methods to local conditions for the development of the mountain region economy, giving active support in capital, materials, grain, livestock breeding, and technology to the mountain regions for the development of herbivorous livestock production. In support of communes lacking capital, the Provincial People's Government allocated 3 million yuan to help mountain areas start up collective livestock farms. They allocated another 1 million yuan of public funds to help 16 mountain counties set up commodity beef bases. In Chunan, Tiantai, and Wencheng counties, provincial agricultural units also set up and operated slaughter beef breeding farms, bull breeding stations, and sheep breeding stations for the breeding of superior varieties for the supply of mountain communes and brigades with superior breeding stock.

Last year the Provincial People's Government also issued a proclamation on the raising of beef cattle, which effectively protected the rights of commune members to raise cattle and encouraged the breeding of heifers. As a result of the former destruction caused by the ultra-leftist line of the "gang of four," the families of commune members in many places were not permitted to raise cows or sheep. Now, acting in accordance with government policies, communes and brigades in many mountain areas have permitted commune members themselves to decide which kinds of livestock to raise and how many to raise without any restrictions.



## BRIEFS

**SUMMER COCOON HARVEST**--After spring cocoon production in the silkworm areas of Zhejiang Province reached the highest levels recorded for spring cocoons since Liberation, a bumper crop of summer cocoons was also harvested to create a new record. Following this year's bumper harvest of spring cocoons, the broad masses in silkworm areas increased the raising of summer cocoons, their enthusiasm for the raising of summer cocoons being very high. Ever since the beginning of summer, all places have used every manner of means to overcome the difficulties posed by large amounts of rainfall, which has caused the mulberry groves to run to weeds and produced serious insect pest infestations. More than 230,000 mulberry leaves have been gathered throughout the province as food for the summer crop of silkworms, an increase of 48,000 leaves. This year there has been a universally balanced high output of summer cocoons. Output of summer cocoons throughout the province has amounted to 152,000 dan, a 28 percent increase over the same period last year. Total output of summer cocoons, per unit yields of cocoons, and the quantity of state purchases of cocoons have all created new records. The quantity of state purchases of spring and summer cocoons provincewide increased by 103,000 dan over the same period last year, for fulfillment of 70 percent of annual state purchase quotas. Despite impairment from inclement weather, the 320,000 early autumn silkworms in the province are currently growing quite well, and most of them have entered the vigorous stage. In late August, their cocoons can be taken and offered for sale. [Text] [Hangzhou ZHEJIANG RIBAO in Chinese 23 Aug 80 p 1] 9432

**LOCAL SUPPLY, MARKETING COMPANIES**--A total of 80,810 commune and brigade enterprises have been developed in Zhejiang Province. They have relied principally on the regulation of the marketplace for the acquisition of materials and the disposal of products rather than on the state plan. In order to help commune and production brigade enterprises with their supply and marketing, regional industrial companies began to be set up rapidly everywhere beginning in March. They frequently conduct analyses of the market situation, and some even set up market information stations in the cities to act as advisors to commune and production brigade enterprises. As of the end of July this year, more than 75 regional industrial supply and marketing companies had been set up in Zhejiang Province to play an active role as a channel of supply and marketing for commune and production brigade enterprises. During the first 6 months of this year, they collected 70,450 tons of artificial fibers, plastic manufactures, and metals, and have sold large amounts of products. A sum of more than 144 million yuan has been involved in these supply and marketing activities, giving vigorous impetus to the development of production by commune and brigade enterprises. Currently, each company is establishing cooperative supply and marketing relationships with all 28 provinces in the country. [Text] [Hangzhou ZHEJIANG RIBAO in Chinese 12 Aug 80 p 2] 9432



ROAD TO MODERNIZATION--Commune and production brigade enterprises in Zhejiang Province have grown quite rapidly during the past several years. Their output value now amounts to one-third that of the three-tiered economy of people's communes throughout the province. In 1978, output value of these enterprises amounted to 2.63 billion yuan of which wages returned to the brigades amounted to more than 305 million yuan, for an average of 11 yuan per commune member. They provided capital for the construction of agriculture in the amount of 125 million yuan, the equivalent of state capital investment in the building of Zhejiang's agriculture for that year. They also paid 138 million yuan in taxes to the state. In 1979, output value of commune and brigade enterprises amounted to 3.12 billion yuan, or 40 percent of the total output value of the three-tiered commune economy. Experience has demonstrated that taking the road of comprehensive agricultural, industrial, and commercial operations has promoted the overall development of production in agriculture, forestry, livestock raising, sideline occupations, and the fishing industry, and has hastened progress toward the modernization of agriculture. It has made the collective and commune members become wealthy with all possible speed. Commune members profoundly realize that, "to get rich requires agriculture, industry and sideline occupations." This is the only road to go. [Excerpts] [Beijing NONGCUN GONGZUO TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 4, 5 Apr 80 p 10] 9432

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Large Plastic Tent

Photo by--Guo Zhaolong [6753 0340 7893]  
Hou Feng [0186 6912]

Caption by--Environmental Engineering Laboratory  
of the Academy of Agricultural Engineering  
Research and Design

Cover 2 -- Using Aerial Bulbs of Garlic As Seeds

Cover 3 -- Photos of "Survey of Spiders in Cotton Fields"  
The Newest Farm Chemical Produced by the Beijing  
City No 2 Farm Chemical Plant--Ethylene Releaser,  
50 Percent Multipurpose Cream

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[ACTA BOTANICA SINICA will be issued bimonthly from 1981 on. It will publish  
original papers involving plant cytology, plant morphology, plant physiology,  
plant biochemistry, plant genetics, phytochemistry, phytoecology, geobotany,  
paleophytology and plant introduction and acclimatization.]

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## Agricultural Machinery

AUTHOR: WANG Wenlong [3769 2429 7127]  
ZHU Yongda [2612 3057 6671]

ORG: WANG of Luoyang Research Institute of Tractors; ZHU of Henan Agriculture College

TITLE: "Buoying Principle of Tractors and Its Applications"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 1-9

TEXT OF ENGLISH ABSTRACT: This paper deals with the buoying principle of farm tractors working on supersaturated very soft soil. The main points are as follows:

1. Supporting and driving functions of the tracting mechanism of the general tractor are performed separately by the body of the boat (or sledge) and the driving device so as to avoid the slipping sinkage. In this way the tractor will always float on the surface of the soil.
2. A smooth streamlined body (or a sledge) with a fair support area should be adopted to reduce the ground contact pressure of the tractor to 0.025-0.06 kg/cm<sup>2</sup> and the maximum sinkage would exceed 5 cm even if the tractor is working on

[Continuation of NONGYE JIXIE XUEBAO No 2, 23 Sep 80 pp 1-9]

the softest soil). (Its center of gravity and center of buoyancy when in operation should be as close as possible to the geometric center of the ground contact area, and the front part of the boat should lip up a little to reduce the sliding resistance.)

3. In order to get enough propulsive force from the soil the tractor must be equipped with a driving walking device with greater shearing area. It is desirable to make the device go into and out of the soil vertically. Only in this way can the tractor fully make use of the soil strength and its resistance can be reduced to a minimum.

4. According to the working conditions, the relative place between the supporting walking device and the driving walking device can be controlled automatically so that the tractor has minimum motion resistance while it develops the tractive force it needs so as to obtain a higher tractive efficiency.

Boat-tractors (paddy field boats), based on the Buoying Principle, have been widely applied in the paddy fields where the orthodox tractor either cannot work or works with less efficiency.

AUTHOR: XU Ting [1776 2185]

ORG: Jilin University of Technology

TITLE: "Some Theoretical Analysis Concerning the Power Transmission of Tractors with Four-Wheel Drive"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 10-16

TEXT OF ENGLISH ABSTRACT: Due to the development of tractors with four-wheel drive, there arises the necessity of studying some theory about the features of power transmission in order to design this type of tractor correctly and use it properly.

Starting from the most fundamental display of the inharmonious motion of the front and rear wheels of the common tractor with four-wheel drive, the difference of skid and slip values, this article analyzes in detail the theoretical principles guiding the process of its design and usage, and some proposals have been put forward. At the same time, on articulated tractors, it should be noted that the selection of the position of the articulated point will have influence on the linearity of the driving of the tractor and the features of the power transmission in the steering process.

AUTHOR: WANG JIANDONG [3769 1696 2639]

ORG: Zhejiang Agriculture University

TITLE: "A New Method Referring to the Imitation of a Tractor Load Curve by Means of Periodical Function in Square Waves"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 17-24

TEXT OF ENGLISH ABSTRACT: A new method is presented here imitating the load curve by means of periodical function in square waves. To date, the Fourier series is used popularly in approximating a certain curve so as to imitate it. It used to be realized by electronic circuit, but this is inconvenient due to its sine curve. Along with the development of electronic technology and integrated circuits, it is very simple to produce a set of square waves. Therefore, the mathematical analyzing method is used to discuss the imitation of curves by means of the periodical function in square waves, and the conversion between the square waves function and the sine function is dealt with as well. In addition, a practical curve is analyzed as an example, and a set of amplitudes of square waves is also calculated. A new curve is formed with these functions and has been compared with the original curve. Finally, an ALGOL-60 process is

[Continuation of NONGYE JIXIE XUEBAO No 2, 23 Sep 80 pp 17-24]

shown which is suitable for the operation by computers. It should be pointed out that this is a new method regarding approximation of curves in general application. It can be used in various cases in addition to load curves.

AUTHOR: CHEN Ruyan [7115 3067 1693]  
DING Chengjie [0002 2052 2638]

ORG: Both of the Beijing Institute of Agricultural Mechanization

TITLE: "Obliquely Placed Clutch Springs--Theoretical Analysis of Working Characteristics and Design Procedure"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 25-38

TEXT OF ENGLISH ABSTRACT: In this paper, requirements and an ideal case concerning the working characteristics of the clutch spring are studied. Emphasis is placed on obliquely placed clutch springs: theoretical analysis of working characteristics, method of constructing the characteristic curves and analysis of all influencing parameters. Selection of design parameters and design procedure of obliquely placed clutch springs are also stated with examples.

AUTHOR: ZHANG Xuqing [4545 2485 3237]

ORG: Research Institute of Agricultural Machinery in Anhui

TITLE: "The Geometrical Characteristic Equations of Meridional Plane Channel of Pumps and Their Numerical Solutions"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 39-50

TEXT OF ENGLISH ABSTRACT: In this paper, the equations which relate the impeller's passage areas to the geometrical data of the sideline of meridional plane channel are established by way of mathematical analytics. The methods which solve these equations under different conditions are indicated also. The analytical method in this paper is more exact than the usual graphic method. It can avoid the tedious process of graph and check, and can solve two kinds of problems--normal or converse propositions. These calculations and solutions are all numerical. Their values are more exact than those which are obtained from the usual method. Three examples are given for reference in this paper.

AUTHOR: YUAN Xiwen [5913 4423 2429]  
YUE Wenfa [1471 2429 3127]

ORG: Both of the Chinese Academy of Agricultural Mechanization Sciences

TITLE: "Experimental Investigation of Hydraulic Model of Centrifugal Submersible Pump"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 51-60

TEXT OF ENGLISH ABSTRACT: The paper describes the regularity of the effect of the impeller inlet and exit parameters and of the form of diffusion casing on the pump characteristic and efficiency. This regularity was initially obtained by means of the hydraulic model experimental investigation. In order to improve the efficiency of the submersible pump, we may adopt measures to contract the inlet diameter  $D_e$ , to increase the setting angle of the blade and to extend the blade to the inlet edge so that the characteristic requirement can be fulfilled. This paper recommends inlet velocity coefficient  $k_0$  in the region of  $3.7 \sim 4.1$ , the blade angle of attack  $8^\circ \sim 15^\circ$ . The form of the inlet edge between the two vanes should be square so that better hydraulic characteristics are obtained.

Since the energy exchange in the diffusion casing was not so reasonable, the

authors think that the formula for calculating the outer diameter  $D_e$  of the centrifugal pump impeller must be revised theoretically so that the characteristic requirement can be reached. This paper recommends a velocity coefficient under several specific speeds  $n_s$ . The relationship between the throat area  $F_3$  of diffusion casing and impeller exit area  $F_2$  is one of the important factors determining the characteristics of the submersible pump. This paper recommends  $F_3/F_2$  in the region of  $0.7 \sim 1$ . There is no oscillation or noise no matter whether the number of vanes in the diffusion casing and impeller is the same or not.

AUTHOR: XU Naizhang [6079 0035 4545]

ORG: Zhejiang Agriculture University

TITLE: "Theoretical Analysis of Rake Finger of Stalk Lifter and Rake Star-Wheel"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 61-75

TEXT OF ENGLISH ABSTRACT: Based on the analysis of the relation between kinematical of rake finger and crops, two fundamental equations are derived. According to these equations, this paper discusses and suggests three parameters. The rake finger is opened up at  $\varphi = 80^\circ \sim \pi/2$  to reduce  $K$  (ratio between kinematical velocity of rake finger and forward velocity of semi-feed combine).  $\theta$  (inclination of the stalk lifter) in a range from  $60-65^\circ$  and  $K$  from 1.44 to 3.51 can adapt better to the harvesting of wheat and dwarf rice.

The estimate formulae of radius ( $r$ ) and circular velocity ( $V_{OS}$ ) of the rake star-wheel,  $r \geq 1/3(B - \Delta S)$  and  $V_{OS} = \frac{r\pi}{r+S} V_m$ , are derived. The position of the rake star-wheel is also discussed.

AUTHOR: MA Ji [7456 7535]  
MAO Guolun [3029 0948 0243]

ORG: Both of the Chinese Academy of Agricultural Mechanization Sciences

TITLE: "Research and Test of Large Cutting Width Vertical Type Reaper with Star Wheel Lifter"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 76-86

TEXT OF ENGLISH ABSTRACT: In order to improve the operating function of the vertical type reaper, the phenomenon and its principle of crop cutting and transferring sideways on the reaper has been studied. The forces acting on crop transfer are analyzed from the viewpoint of kinetics. Thus we can find the way to increase the stability of transferring a crop in a vertical standing condition. The star wheel lifter is a more effective method and yet very simple of those developed between 1973 and 1976.

The vertical type reaper, if adopting this star wheel lifter, may improve its characteristics in many respects, such as avoiding the crop falling down at the front of the reaper when cutting the field end, broadening the limitations of

[Continuation of NONGYE JIXIE XUEBAO No 2, 23 Sep 80 pp 76-86]

the cutting width as well as traveling speed, hence the field output of the modified vertical type reaper can be greatly increased. The feasibility for bad field conditions, such as harvesting light lodging crops, etc., is also improved.



AUTHOR: JIN Chenglie [6855 2110 3525]  
LIU Guanghai [0491 1684 3189]

ORG: Both of the Chinese Academy of Agricultural Mechanization Sciences

TITLE: "Testing Analysis of Threshing and Cleaning Apparatuses of Head Feeding Combine"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 87-98

TEXT OF ENGLISH ABSTRACT: Three models of head feeding combines were tested at Jiangxi, Guangdong and Beijing last year. This paper analyzes the testing results mainly of the threshing cleaning parts and discusses the construction of the parts concerned, with the purpose of finding key points for increasing the capacity of this type of combine.

In this paper the most important point is to analyze machine HD3100GT and to compare it with Minjiang-150 and H3000G.

AUTHOR: GAO Erguang [7559 3643 0342]

ORG: Chinese Academy of Agricultural Mechanization Sciences

TITLE: "The Tests and Analyses of Imported Plow for Big-Power Tractors"

SOURCE: Beijing NONGYE JIXIE XUEBAO [TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL MACHINERY] in Chinese No 2, 23 Sep 80 pp 99-113

TEXT OF ENGLISH ABSTRACT: The trends toward greater width, higher speed and higher efficiency have been seen from the tests and structural analyses of some imported plows for big-power tractors. There is also some new progress in plow design parameters, product construction, materials and manufacturing technology.

In addition, this paper has also made a comprehensive analysis on the test results, design parameters and structural characteristics of some imported plows for big-power tractors.

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